

## **REMARKS**

### **I. Status of the Application**

Claims 25-27, 29-38, 40-43, and 47-52 are pending in the application. Claims 1-24, 28, 39, and 44-46 have been previously cancelled without prejudice to the filing of any appropriate continuation applications.

Claims 25, 27, 29, 32-37, 40, 47-48, and 50-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky et al. (U.S.P.N. 4,141,783, hereinafter “Pisecky”) in view of Badertscher (GB 2 036 534) and further in view of Fabre (U.S.P.N. 4,689,237).

Claim 49 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Den Hollander (U.S.P.N. 5,558,819).

Claims 26, 30, and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Rubens (EP 0 438 783).

Claims 38 and 41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claims 37 and 40, and further in view of Passey (U.S.P.N. 3,564,723).

Claim 42 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher, Fabre, and Passey applied to claim 41, and further in view of Hovmand et al. (U.S.P.N. 4,062,641, hereinafter “Hovmand”).

Claim 43 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Johnston (U.S.P.N. 2,401,077).

Applicant has amended the claims under consideration to more clearly define and distinctly characterize Applicant's novel invention. Specifically, independent claim 25 has been amended to delete the "wherein after drying" limitation and to positively recite the method step of drying the pasteurized or sterilized product into powder form. Support for this amendment can be found throughout the specification as filed, for example at page 11, lines 9-14, and the passage on drying from page 12, line 12 to page 14, line 18. In addition, claim 25 has been amended for clarity by replacing the word "while" with the word "by." Support for this amendment can be found throughout the specification as filed, for example at page 7, lines 6-8: "**Preferably, as a result of** a turbulent **mixing** of product flow and steam a **fine spray** is formed, so that the product present in the spray is rapidly heated." Webster's Ninth New Collegiate Dictionary defines the term "atomize" as "to reduce to minute particles or to a fine spray." Webster's Ninth New Collegiate Dictionary defines the term "by" as "4a: through the agency or instrumentality of <by force>." Additional support can be found throughout the specification, for example at page 8, lines 22-25: "The mixing is preferably realized by contacting the product flow and the steam flow close to the inflow opening of the product in the mixing chamber and bringing the steam at high speed around the product, which is thereby broken up into small droplets." Thus, the specification provides inherent support for the amended claim element: "**substantially atomizing** the product in liquid form **by admixing steam** in a mixing chamber..."

Applicant respectfully submits that these amendments presented herein does not raise new issues requiring further search, and adds no new matter. Applicant respectfully requests entry and consideration of the foregoing amendment in view of the following remarks, which are intended to place the case in condition for allowance.

## **II. The Pending Claims Are Non-Obvious over the Cited Art**

At page 2, section 3 of the instant Office Action, claims 25, 27, 29, 32-37, 40, 47-48, and 50-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and further in view of Fabre. At page 7, section 4 of the instant Office Action, claim 49 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Den Hollander. At page 7, section 5 of the instant Office Action, claims 26, 30 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Rubens. At page 8, section 6 of the instant Office Action, claims 38 and 41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claims 37 and 40, and further in view of Passey. At page 9, section 7 of the instant Office Action, claim 42 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher, Fabre, and Passey as applied to claim 41, and further in view of Hovmand. At page 9, section 8 of the instant Office Action, claim 43 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Johnston. Applicant respectfully traverses these rejections.

### **A. The Combination of Pisecky, Badertscher, and Fabre Fails to Render the Claimed Invention Obvious.**

The Examiner relies upon Pisecky for teaching atomization of a liquid (col.6, lines 38-40) while admixing steam in a mixing chamber (col. 6, lines 30-31). These two sections of Pisecky disclose that the atomization takes place in a drying chamber (not shown) and that the mixing with steam takes place in annular chamber 18, two **distinct** and **separate** locations. Taken in

context, col. 6, lines 30-58 of Pisecky teaches a sequential process of mixing steam with milk concentrate in annular chamber 18, flowing the mixture of steam and milk via annular duct 21 into supply compartment 4 wherein air and steam are released and removed, and then atomizing the liquid into the drying chamber (not shown) by physically flinging it out through ejection apertures 6. In Pisecky, atomization does not take place in the same step as mixing steam with milk concentrate in a mixing chamber, but afterwards in a separate step and in a separate location.

The pending claims have been amended to clarify that they do not encompass a method wherein the product in liquid form is atomized in one location, while in another location termed the mixing chamber, the product is mixed with steam. Instead, the amended claims recite the step of “substantially atomizing the product in liquid form **by** admixing steam in a mixing chamber heated by the steam so as to kill microorganisms and produce a pasteurized or sterilized product.” Thus, in the claimed method, atomization of the product in liquid form is a result of mixing with steam in a mixing chamber, so the atomization and the mixing take place in the same step and in the same location.

Applicant maintains the position that Pisecky fails to teach or suggest atomizing a product in liquid form by admixing steam in a mixing chamber. Instead, Pisecky teaches atomizing a product in liquid form by flinging the liquid out of ejection apertures 6 in an atomizer wheel (col. 6, lines 38-40). In Pisecky, atomization clearly does not occur when steam is mixed with the liquid product in annular chamber 18. Nowhere does Pisecky teach or even suggest that atomization occurs or is caused by mixing steam with the liquid product.

Badertscher fails to remedy the deficiencies of Pisecky. Badertscher is completely silent regarding atomization. Instead, Badertscher teaches at page 1, lines 89-95: “Using the apparatus

according to the present invention, it is possible to inject only that quantity of steam which is required for bringing the fluid product to the required temperature by **condensation** on the product of all the steam injected. The heated fluid mass may have a high level of homogeneity on leaving the apparatus ..." Badertscher may teach a homogeneous mixture of fluid product and steam in a mixing chamber, but clearly fails to teach or suggest atomization of a liquid product by admixing steam in a mixing chamber.

Fabre fails to remedy the deficiencies of Pisecky as well. Fabre is also silent regarding atomization. In the mixing chamber 10 of Faber, there is not even homogeneous mixing of vapor with fluid, as disclosed in the abstract: "... injecting the vapor from the annular chamber into the mixing chamber perpendicularly to the fluid flowing through the mixing chamber. A stream of the fluid, vapor, and vapor-fluid mixture thus obtained is passed through and out from the mixing chamber ..." Fabre clearly does not teach or suggest atomization of the fluid by admixing steam in the mixing chamber. Indeed, it is highly unlikely that atomization takes place in the mixing chamber of Fabre since the stream of fluid, vapor, and vapor-fluid mixture then passes out of the mixing chamber into a constricting means and a passage means so as to generate cavitation (formation of bubbles in flowing liquid under low pressure) and critical flow therein (abstract). So instead of atomization, Fabre uses cavitation and critical flow to thoroughly mix and heat the fluid with the vapor.

For at least the foregoing reasons, the combined disclosures of the cited references fail to teach or suggest the step in independent claim 25 of substantially atomizing the product in liquid form by admixing steam in a mixing chamber heated by the steam so as to kill microorganisms and produce a pasteurized or sterilized product. The skilled artisan would not be motivated by Badertscher or Fabre to modify the teachings of Pisecky to atomize the liquid product in a

mixing chamber by mixing with steam, instead of atomizing by flinging the liquid product out of an atomization wheel into a drying chamber, because both Badertscher and Fabre are silent regarding atomization. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection and allowance of claims 25, 27, 29, 32-37, 40, 47-48, and 50-52.

**B. Any combination of cited references fails to render the claimed invention obvious.**

None of the remaining references, alone or in combination, cures the deficiencies of the references discussed above.

The Examiner relies upon Den Hollander to teach placement of distribution plates in the steam inflow openings. But Den Hollander fails to remedy the deficiencies of Pisecky, Badertscher, and Fabre. Den Hollander also fails to teach or suggest atomization of a liquid product by admixing steam in a mixing chamber. Instead, Den Hollander teaches that the liquid is introduced into the downflow heater plant as liquid jets which can be very elongated and retain their shape, and that steam condenses on the liquid jets (col. 2, lines 4-8, lines 17-21, line 33). Den Hollander is completely silent regarding atomization. Therefore, claim 49 is not rendered obvious by the combined teachings of Pisecky, Badertscher, Fabre, and Den Hollander.

The Examiner relies upon Rubens for disclosing the size of the mixing chamber being in the range of 13 mm to 51 mm (page 5, lines 4-7), and the outlet opening being between 6.3 mm and 13 mm, which size may be varied depending on temperature and moisture content as well as flow rates (page 5, lines 32-35). However, Rubens cannot be combined with Pisecky because the parameters of the two-fluid, internal-mix spray drying nozzle of Rubens physically cannot be mapped onto the spray drying atomizer wheel of Pisecky. The size of the mixing chamber of Rubens is disclosed as the distance between the inlet port and the vent aperture. However, the

mixing chamber of Pisecky (annular chamber 18) does not directly open onto the ejection aperture as it does for Rubens, but instead passes through duct 21 and supply compartment 4 before arriving at ejection aperture 6, where the liquid exits at a 90° angle from its direction of flow from the mixing chamber. It is unclear whether the distance disclosed by Rubens between inlet port and vent aperture should be mapped onto the length of the path traveled by a liquid flowing from annular chamber 18 to ejection aperture 6 in Pisecky, or to the straight-line distance between annular chamber 18 and ejection aperture 6, or to the distance between milk and steam inlets 16 and 17 and annular duct 21 which flows out of annular chamber 18. In any case, since the shape and arrangement in space of the mixing chambers and vent apertures of Rubens and Pisecky are so different, the effect in Pisecky of applying or varying the size of the vent aperture and the distance between the inlet port and vent aperture given by Rubens would be unpredictable. The skilled artisan cannot expect a similar effect, much less a beneficial effect, from sizing the mixing chamber and ejection aperture of Pisecky according to the sizes disclosed by Rubens. Therefore, claims 26, 30, and 31 are not obvious over a combination of Pisecky, Badertscher, Fabre, and Rubens.

The Examiner relies upon Passey for disclosing the drying of a material with superheated steam which is bled off and reheated and then returned to the drying chamber (col. 2, lines 21-27). However, Passey fails to remedy the deficiencies of Pisecky, Badertscher, and Fabre. Passey fails to teach or suggest atomizing a liquid product by **admixing steam** in a mixing chamber. Instead, Passey teaches that the material to be dried is sprayed into drying chamber 1 through inlet 3 where it comes into contact with superheated steam (col. 4, lines 26-31). Thus, atomization is not a result of mixing with steam, but is instead a result of spraying through inlet

3. Therefore, claims 38 and 41 are not rendered obvious by the combined teachings of Pisecky, Badertscher, Fabre, and Passey.

The Examiner relies upon Hovmand to teach the recirculation of non-agglomerated particles. However, Hovmand fails to cure the deficiencies of Pisecky, Badertscher, Fabre, and Passey. Hovmand is directed to an agglomerating unit which deposits moistened powder on its conical inner surface (abstract). Hovmand is not related to methods for pasteurization or sterilization, and certainly fails to teach or suggest atomizing a liquid product by admixing steam in a mixing chamber. Thus, claim 42 is not rendered obvious by the combined teachings of Pisecky, Badertscher, Fabre, Passey, and Hovmand.

The Examiner relies upon Johnston to teach a microorganism decimal reduction of at least 2. But Johnston fails to cure the deficiencies of Pisecky, Badertscher, and Fabre. Johnston fails to teach or suggest atomizing a liquid product **by admixing steam** in a mixing chamber. Instead, Johnston atomizes its liquiform material by spraying it at high pressure through a spray nozzle into a low-pressure steam filled chamber (page 2, left column, lines 41-54). In fact, Johnston teaches away from atomization as a result of mixing with steam. “In the improved method of this invention, the impact of steam particles against the food material is **deliberately avoided** since it appears that the physical or chemical change which such methods effect in the materials is responsible for reduced stability and flavor change in the sterilized product.” (page 2, right column, lines 19-25) Thus, it would not be obvious to the skilled artisan to modify the combined teachings of Pisecky, Badertscher, Fabre, and Johnston to arrive at claim 43.

For at least the foregoing reasons, the combination of cited references fails to teach, suggest, to provide motivation to combine teachings, or to provide motivation to modify teachings to arrive at the claimed invention. Accordingly, Applicant respectfully requests

withdrawal of the 35 U.S.C. §103(a) rejection and allowance of claims 26, 30, 31, 38, 41-43, and 49.

**III. Conclusion**

Having addressed all outstanding issues, Applicant respectfully requests reconsideration and allowance of the present application. To the extent the Examiner believes that it would facilitate allowance of the case, the Examiner is requested to telephone the undersigned at the number below. The Commissioner is hereby authorized to charge any additional fees or credit overpayment to Deposit Account No. 19-0733.

Respectfully submitted,

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